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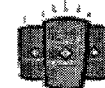
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Science News - December 21, 2001

High perchlorate levels in fish puzzle researchers



"Surprisingly high" concentrations of perchlorate have been found in fish taken from two contaminated former military sites in Texas, say Texas Tech University researchers. They note, however, that their preliminary results are difficult to interpret because of the complex hydrology at the sites.

Other scientists also say that the findings should be considered with caution because it is extremely difficult to use ion chromatography to measure perchlorate in animal tissues. EPA analytical chemist Ed Urbansky is unsure about the results because he hasn't seen any data on the validation of the ion chromatography method and the assessment of possible interferences or possible signal reduction in the tissue matrixes. The Texas Tech researchers describe their analytical methods in a forthcoming issue of the *Bulletin of Environmental Contamination and Toxicology*.

The findings come just before the anticipated publication in January 2002 of EPA's toxicological review of perchlorate for humans and the environment. The review will form the basis for an eventual federal regulatory standard for perchlorate in drinking water and could prompt a rapid revision of state standards. Although the Texas Tech researchers' results are preliminary, they partly prompted the Texas Natural Resources Conservation Commission to lower its perchlorate standards last fall.

Field results indicate that fish appear to concentrate perchlorate in their heads and, to a lesser extent, in other body locations, according to Texas Tech toxicologist Todd Anderson. Several thousands parts per billion (ppb) of perchlorate were found in the heads of small fish collected near one contamination hot spot near the former Naval Weapons Industrial Reserve Plant at McGregor, Texas near Waco. Bass and catfish from other locations were found to have hundreds of ppb in their fillets, according to U.S. Army Corps of Engineers chemist Brian Condike, who is project manager for the McGregor study. The Texas Tech team found similar results at the Longhorn Army Ammunition Plant in Karnack, Texas (*Ecotoxicol.* **2001**, *10*, 305-313).

Because perchlorate is generally thought to behave like nitrate or other anions and not to accumulate in wildlife, the preliminary data raise intriguing questions about how such elevated levels of the contaminant may have occurred. Concentration of perchlorate in fish thyroid may explain the high levels in fish heads, says Anderson. Another explanation might be that

perchlorate is adhering to fish gills because they are designed for ion balance, say EPA scientists. Because lab results fail to demonstrate substantial concentration of perchlorate in fish from water, the fish in the field may be getting high levels of perchlorate from plants in their diet, says Texas Tech scientist Reynaldo Patino.

At the McGregor site, the relatively few samples and complex site hydrology make it difficult to interpret the data, says Condike. The McGregor site is situated on limestone karst with shallow seeps and springs. Water at the site can dive down below the surface, flow underground, and then return to the surface again, he says, explaining that this can lead to unexpected perchlorate hot spots.

“We don’t [yet] know a lot about perchlorate and its effects in aquatic life,” says fish specialist Erin Snyder at Pennsylvania State University. Snyder is involved in a new SERDP-funded study aimed at assessing thyroid and other possible endocrine disrupting effects of perchlorate on fish in Lake Mead. “Does it act like a water-soluble salt or is there a selective uptake mechanism for it? Right now, there aren’t enough data to know what’s going on,” she says. —REBECCA RENNER

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